

AIR POLLUTION AND MOLECULAR MARKERS OF ASTHMA AMONG UTEP COHORT SIBLING PAIRS

Esther Erdei, *University of New Mexico*

Orrin Myers, *University of New Mexico*

Cassandra Garner, *University of New Mexico*

Alma Ruiz-Payan, *University of Texas—El Paso*

Kirsten A. White, *University of New Mexico*

M. Berwick, *University of New Mexico*

M. Amaya, *University of Texas—El Paso*

N. Pingitore, *University of Texas—El Paso*

Background and Aims: The Sibling Pair Asthma (SPA) study is a joint effort between the University of Texas at El Paso and the University of New Mexico Health Sciences Center funded by NIEHS. We investigated the impact of air quality on asthma prevalence among Mexican-American children.

Methods: Households from an ongoing cohort study with at least one asthmatic child and a non-asthmatic sibling were invited to participate in this study (N=104 children from 51 households). Participants of this study were 98% Mexican-Americans. Blood samples were collected using a mobile van among community residents. Serum total IgE was obtained and categorized as high (>89 IU/ml) or low concentration. Quantification of 10 serum cytokines important in asthmatic inflammation was carried out using xMAP bead-based technology and Luminex 100™ detection system. Daily concentrations of NO₂, O₃, SO₂, PM_{2.5}, and PM₁₀ from USEPA air quality archives were used to calculate 1-7 day lagged concentrations. Chronic spatial gradients in pollution levels were created using traffic intensity, elevation, and distance to major point sources to predict NO₂ concentrations.

Results: Higher IgE levels were associated with coughing (60.8% vs. 35.9%, p=0.01) and with the number of respiratory symptoms (2.4±2.1 vs. 1.6 ± 2.0, p=0.036). IgE was correlated with 7-day average 8-hr maximum ozone (rho =0.34 p=0.01). IL-4 was correlated with average one-day lagged ozone (rho=0.34 p=0.01) and two-day lagged ozone (rho=0.29 p=0.03). The effect of NO₂ exposure on increased IL-5 cytokine production was stronger among asthmatic children than in their non-asthmatic siblings. Increased serum IL-8 concentrations were associated with increased PM_{2.5} exposures among non-asthmatic children, but not among asthmatics with high IgE. The chronic spatial exposure gradient was not associated with cytokine production.

Conclusions: Air pollutants had different effects on serum immune markers among sensitive asthmatic children compared to their healthy sibling pairs.